

REMARKS

Claims 1-7 and 13-16 are pending in this application. Of these, the Official Action continues to reject Claims 1, 2 and 7 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,471,464 to Ikeda (hereinafter the "Ikeda '464 patent"). The Official Action also continues to reject Claims 3-6 under 35 U.S.C. §103(a) as being unpatentable over the Ikeda '464 patent in view of the Zhang '254 publication. Finally, the Official Action rejects claims 13-16 under 35 U.S.C. §103(a) as being unpatentable over the Ikeda '464 patent in view of U.S. Patent Application Publication No. 2005/0276254 to Zhang (hereinafter the "Zhang '254 publication"). As explained below, however, Applicant respectfully submits that the claimed invention is patentably distinct from the Ikeda '464 patent and the Zhang '254 publication, individually or in combination. Accordingly, Applicant respectfully traverses the rejections of the claims as being anticipated by the Ikeda '464 patent or unpatentable over the Ikeda '464 patent in view of the Zhang '254 publication. Based on the following remarks, reconsideration of the present application and allowance of the current set of claims is respectfully requested.

Generally, the present application discloses an orthogonal frequency division multiplexing (OFDM) wireless communication system operable on a frequency selectable channel and a channel compensation method for reducing bit error rates (BER) in an interval with a narrow channel amplitude and for improving total rates. In terms of amended independent Claim 1, for example, the OFDM wireless communication system comprises a transmitter for performing inverse discrete Fourier transform (IDFT) on information transmit vectors at least twice to modulate it into OFDM signals, transmitting the modulated OFDM signals through a multipath fading channel, modulating a pilot symbol vector for predicting an amplitude and a phase of the multipath fading channel into an OFDM signal, and transmitting the modulated OFDM signal through the multipath fading channel. In this regard, the transmitter comprises a first IDFT unit for performing IDFT on the information transmit vectors and outputting IDFT-performed signals; and a second IDFT unit for performing IDFT on the IDFT-performed signals output from the first IDFT unit to modulate them into OFDM signals. The system of Claim 1

further comprises a receiver for demodulating the pilot symbol vector received through the multipath fading channel. The receiver comprises a first discrete Fourier transform (DFT) unit for demodulating the received information transmit vectors into OFDM signals; and a second DFT unit for performing DFT on the compensated information transmit vectors and averaging a noise signal value.

By contrast, the Ikeda '464 patent discloses an OFDM demodulation apparatus and method which generate a discrete Fourier transform (DFT) timing window signal and enable demodulation of the OFDM modulated signal even when the signal is affected by noise. The Ikeda '464 patent also discloses an OFDM modulation apparatus including a first IDFT means for performing IDFT on a first digital component signal (I channel signal) to produce a first time region composition signal and a second IDFT means for performing IDFT on a second digital component signal (Q channel signal) to produce a second digital component signal. The Official Action asserts, on pages 2 and 16, that the Ikeda '464 patent discloses "a first IDFT means for performing IDFT on a first digital component signal to produce a first time region composition signal" and "a second IDFT means for performing IDFT on a second digital component signal in an orthogonal relationship with the first digital component signal to produce a second time region composition signal" at col. 6, lines 47-65. As such, the Official Action alleges that the Ikeda OFDM apparatus corresponds to "performing IDFT (inverse discrete Fourier transform) on information transmit vectors at least twice" and "a first IDFT unit for performing IDFT on the information transmit vectors and outputting IDFT-performed signals; and a second IDFT unit for performing IDFT on the IDFT-performed signals output from the first IDFT unit" as recited in the claimed invention. Applicant respectfully disagrees.

The Ikeda '464 patent discloses that the I and Q channel signals, which are in an orthogonal relationship with each other, are respectively input into the S/P converters 301 and 302, respectively, and are fed to the IDFT circuit 303. See FIG. 5 and col. 16, lines 38-49 of the Ikeda '464 patent. Although the Ikeda '464 patent discloses "a first IDFT means for performing IDFT on a first digital component signal to produce a first time region composition signal" and

“a second IDFT means for performing IDFT on a second digital component signal in an orthogonal relationship with the first digital component signal to produce a second time region composition signal”, at most the first IDFT unit performs IDFT once on a first component and the second IDFT unit performs IDFT once on the second component. In this regard, the Ikeda ‘464 patent discloses that IDFT is performed on the first and second digital component signals in a parallel fashion but only once on each component signal. As such and at most, the Ikeda ‘464 patent discloses an IDFT circuit 303 that performs IDFT processing only once on the orthogonal relationship between the I channel signal and the Q channel signal. See column 16, lines 50-53. Accordingly, the Ikeda ‘464 patent fails to teach or suggest that IDFT is performed at least twice on each of the two component signals or on the orthogonal relationship between the signals.

Further, the Ikeda ‘464 patent discloses that a second IDFT performs IDFT on a second digital component signal in an orthogonal relationship with the first digital component signal, and not the first time region composition signal, which is the output from IDFT being performed on the first digital component signal. See col. 6, lines 47-65. This passage of the Ikeda ‘464 patent cited in the Official Action and the remaining portions of the Ikeda ‘464 patent all fail to teach or suggest that the first time region composition signal is fed into the second IDFT unit, or even that the second time region composition signal is fed into the first IDFT unit. It necessarily follows that the Ikeda ‘464 patent also fails to teach or suggest that the second IDFT unit performs IDFT on the first time region composition signal which is the output from the first IDFT unit.

By contrast, independent Claim 1 recites a transmitter for performing IDFT on the information transmit vectors at least twice in a serial or sequential fashion to modulate them into OFDM signals. In this regard, the first N-point IDFT unit performs IDFT on the information transmit vectors and the second N-point IDFT unit performs IDFT on the IDFT-performed signals output from the first IDFT unit to modulate them into OFDM signals. See, for example, Figure 1 and paragraph [0039] of the present application. As such, the first N-point IDFT unit and the second N-point IDFT unit are arranged in a serial fashion. See, for example, Figure 1 of

the present application. In some embodiments, this process may be applied in order to reduce error rates in an interval with a channel amplitude below an average, as described above.

For at least the foregoing reasons, Applicant respectfully submits that the Ikeda '464 patent fails to teach or suggest each and every element of independent Claim 1. Accordingly, independent Claim 1 and the claims dependent therefrom, namely Claims 2-6, are not anticipated by the Ikeda '464 patent. In terms of the serial arrangement of the first and second N-point IDFT units, independent Claims 7 and 13 recite features similar to independent Claim 1. Therefore, the Ikeda '464 patent also fails to teach or suggest each and every element of independent Claims 7 and 13. Accordingly, independent Claims 7 and 13 and the claims dependent from Claim 13, namely Claims 14-16, are also not anticipated or obviated by the Ikeda '464 patent.

Further, with respect to the rejection of Claims 3-6, Applicant initially notes that Claims 3-6 depends from and includes the features of independent Claim 1 which is patentably distinct from the Ikeda '464 patent for at least the reasons discussed above. Moreover, the Official Action acknowledges that the Ikeda '464 patent fails to teach or suggest several features of Claims 3-6 and relies on the Zhang '254 publication for overcoming the deficiencies of the Ikeda '464 patent with respect to those claims. However, Applicant respectfully submits that the Zhang '254 publication also fails to teach or suggest the serial performance of IDFT by the first and second N-point IDFT units. Indeed, the Zhang '254 publication is not cited for the proposition and fails to overcome the deficiencies of the Ikeda '464 patent such that any combination of the Zhang '254 publication and the Ikeda '464 patent fails to teach or suggest the serial performance of IDFT by the first and second IDFT units. Accordingly, Applicant respectfully submits that the Ikeda '464 patent and the Zhang '254 publication, taken individually or in combination, fail to teach, suggest or render obvious Claims 3-6.

Therefore, Applicant respectfully submits that the rejection of Claims 1, 2, and 7 under 35 U.S.C. §102(e) and the rejection of Claims 3-6 under 35 U.S.C. §103(a) are overcome.

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With respect to the rejection of Claims 13-16, Applicant initially notes that the Official Action acknowledges on page 12 that the Zhang '254 publication fails to teach or suggest "(a) performing IDFT on information transmission vectors to modulate the vectors into OFDM signals, and transmitting the modulated signals through the multipath fading channel" and "(b) modulating a pilot symbol vector for predicting an amplitude and a phase of the multipath fading channel into an OFDM signal, and transmitting the modulated signal through the multipath fading channel."

Nevertheless, the Official Action asserts that the Ikeda '464 patent overcomes the deficiencies of the Zhang '254 publication. However, for at least the reasons discussed above, the Ikeda '464 patent fails to teach or suggest performing IDFT on information transmission vectors at least twice and a transmitter that comprises a first IDFT unit for performing IDFT on the information transmit vectors and output IDFT-performed signals; and a second IDFT unit for performing IDFT on the IDFT-performed signals output from the first IDFT unit to modulate them into OFDM signals. Moreover, the Zhang '254 publication also fails to teach or suggest the serial performance of IDFT by the first and second IDFT units. Indeed, the Zhang '254 publication is not cited for the proposition and does not make up for the deficiencies of the Ikeda '464 patent such that any combination of these references fails to teach or suggest the serial performance of IDFT by the first and second IDFT units. Accordingly, Applicant respectfully submits that the Ikeda '464 patent and the Zhang '254 publication, taken individually or in combination, fail to teach, suggest or render obvious Claims 13-16. Therefore, that the rejection of Claims 13-16 under 35 U.S.C. §103(a) is overcome.

For at least the foregoing reasons, Applicant respectfully submits that the pending claims, namely Claims 1-7 and 13-16, are patentably distinct from the Ikeda '464 patent and the Zhang '254 publication, individually or in combination, and accordingly Claims 1-7 and 13-16 are allowable.

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CONCLUSION

In view of the claim amendments and the foregoing remarks, Applicant respectfully submits that all of the claims of the present application are in condition for allowance. It is respectfully requested that a Notice of Allowance be issued in due course. The Examiner is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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